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Volume XXV Toronto, November, 1947 Number 2

The University of Toronto Medical Journal

(AN UNDERGRADUATE PUBLICATION)

This journal is published six times a year, November to April, by the Medical Society of the University of Toronto, to serve as a medium for student expression and to bring to the student recent articles of scientific interest.

$1.50 per volume. 25c. per single copy.

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EDITORIAL

THE CANADIAN INTERN BOARD

The Canadian Intern Board was founded by William Kerr in 1939, to fill a definite need. At that time the system by which the members of the graduating year obtained their intern appointments was chaotic, nerve-racking to the student, and unsatisfactory to the hospital. The student applied to the hospitals in which he would like to serve, and awaited developments. He might be accepted by all, some or none. He might accept a position, only to find a week later, he had received a much more desirable offer. The hospitals chose their interns, and were never sure whether they would accept their appointments, or, having accepted them, would not resign them to accept a better post.

The Canadian Intern Board supplied a system by which this confusion and source of heartbreak could be minimized, if not eliminated.

Under the board, each student applied, on the form required by the hospital, to all the hospitals from which he would accept appointments. On a form supplied by the board, he listed all the hospitals to which he had applied, in order of preference. It was an essential feature of the plan, that the information on this form was completely confidential, and the hospital authorities never were

informed how their hospital had been ranked by the applicant. The hospitals considered the applications they had received in whatever manner they had been accustomed to use, applying their own criteria for selecting interns. Then, on a form supplied by the board, they listed all the applicants whom they would accept as interns under two headings. The first list contained the number of names needed to fill the hospital quota. That is, if the hospital needed twenty interns, the first list contained twenty names. The second list contained the names of all the other acceptable applicants, in order of perference. This completed form was then sent to the intern board. Needless to say, it was also confidential.

The duty of the secretary of the board, who was a final year student, was purely clerical; he had no discretionary powers. He simply dovetailed the forms submitted by the applicants and by the hospitals. For example if the name of a student appeared in the quota list of a hospital, and the student had listed that hospital first in his order of preference, he was assigned to that hospital without further adue. If a student was not on the quota list, but had placed a hospital first on his list, his application was set aside until it could be seen whether enough of the men who were on the first list had elected to go elsewhere, thus producing sufficient vacancies on the quota to give him place. Of course, if his name did not appear in the preferential list of the hospital, he could never be assigned to it.

Once this purely mechanical clerical task had been performed, the forms were returned to the hospitals, and they could inform the applicants of their appointments in their own way.

It will be immediately seen that this plan required cooperation from both students and hospitals. The time of making appointments and applications had to be uniform. The student had to list all the hospitals to which he had applied, and had to be willing to accept the post offered to him. The hospitals had to accept the interns assigned to it, and not refuse appointments to these men. And, very important, neither party could seek for information to which it was not entitled.

As originally set up, the board had to serve all Canadian students, and all Canadian hospitals. It was therefore set up under the sponsorship of the Canadian Association of Medical Students and Interns, as this national body seemed to be the ideal sponsor. However, through the years, it has become apparent that the plan was not universally applicable. Many Universities have undergraduate internships as part of their requirements. These appointments are therefore naturally made by the university concerned. Other schools had systems of their own, which seemed to them to be more desirable. Therefore, last year the only large group to use the board was the final year in this university.

It therefore seems that at present there is no chance that the Canadian Intern Board can act on a national basis. However, the executive of Camsi has given this university permission to carry on the board.

While not effective nationally, the board has been very effective locally. Last year, ninety per cent of the final year used the board, and eighty per cent were assigned to the hospital of their first choice. The students of this university have come to depend on the board, and we believe that most of them would be

horrified at the thought of having to obtain an appointment without the aid of the C.I.B.

However, even locally, the application of the plan has not been ideal. Its faults have all been directly due to failure of cooperation. We repeat that perfect cooperation, on the part of both students and hospitals, is essential to the working of the board, and without this, the board cannot and will not function.

At the beginning of this term, there was considerable discussion on the Medical Society, about the fate of the board. There were three alternatives. First, to return to the catch-as-catch-can system that had existed prior to 1939. Secondly, to revive and strengthen the Canadian Intern Board. Thirdly, to devise some other scheme. A motion was passed at a meeting of the Society held on Sept. 28th, stating that the Medical Society approved of the principle of the Canadian Intern Board, and giving Miss Ley, the Toronto Chairman of Camsi, its permission to set the machinery of the board in action. The Society suggested that the help and advice of Dr. Macfarlane be sought.

By the time you read this—subject to the pleasure of the University of Toronto Press—final decisions will have been made. We hope that the C.I.B. will be continued. We hope that it will be continued to serve Toronto students applying for positions in any accredited hospital in Canada. We hope that provision will be made to allow students from other Universities to use the facilities of the board, at a future date.

Most important, we urge cooperation. This is a service, and a very real service. It is also a chance to be honest.

CONGENITAL HEART DISEASE

F. CARLYLE HAMILTON, B.A., M.B.

KNOWLEDGE of cardiac disease has increased tremendously in the past forty years. While congenital cardiac lesions constitute only one or two per cent of all forms of heart disease, improvement in our knowledge of these lesions has kept pace with the general trend. When it was my privilege in 1930 to visit the cardiac clinics in Vienna, I found that cardiologists there knew only one Canadian doctor, namely the late Dr. Maude Abbott, whose painstaking work has cleared up many fundamental points in the study of congenital heart disease. These specialists were not in agreement as to who should be named the father of cardiology, but there was no doubt in their minds as to its maternal origin. While this is disconcerting to mere male physicians, the women in medicine in Canada, have a forerunner of whom they should feel justly proud.

During the past decade, the successful surgical treatment of several types of congenital lesions of the heart has added much interest to the subject. At the same time, it places more responsibility on physicians to detect and properly classify patients suffering with these disorders, and to aid in selecting those in whom surgical intervention is indicated. Still more recently, successful treatment by penicillin, of subacute bacterial endocarditis, which is a frequent complication of congenital heart disease, has altered the outlook in many cases.

Congenital cardiac lesions may be so slight that the patient may go through a normal span of life without embarrassment, or even without detection of his lesion; or on the other hand, so extensive as to make extra-uterine life impossible. Slight defects in closure of the foramen ovale are found so frequently (about 25 per cent), in any series of postmortem examinations, that this particular abnormality should not be included in our present discussion. Congenital lesions of the heart are frequently multiple, and this at times adds to the difficulty of making an exact diagnosis. The severer forms of congenital heart disease may result in a stunting of physical and mental development.

Abbott's study of one thousand cases of congenital cardiac lesions revealed 74 subvarieties. About a dozen of these are recognizable ante-mortem, but these latter taken collectively constitute more than half of the total number of cases. It is the purpose of this paper to discuss the diagnosis of the better known types, and to refer to the treatment of these. No attempt will be made to discuss the theories dealing with the causes of congenital heart disease or with the embryological processes concerned.

A common type is patency of the interventricular septum, also termed interventricular septal defect. This is sometimes called Roger's Disease, since it was first described by a Frenchman, Roger, whose name must therefore be pronounced in the French manner. The diagnosis rests on the finding of a loud systolic murmur and thrill well localized to the fourth left intercostal space near the sternum. The palpation of a thrill in this location should seldom be confused with the systolic thrill of aortic stenosis found in the aortic area, or with the mitral

systolic thrill which may accompany mitral regurgitation. The cause of the murmur described ("Roger's murmur") is the flowing of blood from left to right ventricle due to the marked difference in pressure in these two chambers during systole. Considering this mechanism, it is obvious that the patient will not be cyanosed. Lesser lesions, since there is more hindrance to the flow of blood through the defect, should have a more marked murmur and thrill than those in which the patency is more extensive and more serious. Some enlargement of both ventricles may be found, but since both are overworked to approximately the same degree, no abnormal axis deviation occurs in the electrocardiogram. The majority of patients with this type of lesion have little or no circulatory embarrassment. Their embarrassment comes when they apply for life insurance. Some of them do eventually develop subacute bacterial endocarditis, and should then be adequately treated with penicillin. Aside from this possible urgent development, no particular treatment of these cases is indicated.

While we are on the subject of septal defects, it might be well to discuss next, interatrial septal defects. With these, a loud pulmonary systolic murmur is often present, but the diagnosis is usually made by x-ray examination. Some cardiac enlargement is common, and may be marked. It is more difficult to explain this enlargement than in interventricular defects, but in some cases at least, superimposed rheumatic valvular disease to which these cases are frequently subject, is a major factor. By x-ray, the cardiac outline consists of a series of prominent curves: that of the right auricle to the right, and of the prominent pulmonary artery and enlarged right ventricle on the left. In addition, heavy hilus shadows are present and these may pulsate actively. The electrocardiogram may assist, in that right axis deviation is to be anticipated, and not infrequently the QRS complexes are widened. No specific treatment is available.

Occasional cases are described in which the septal defect, whether interauricular or interventricular, is so great that a three-chambered, or even a two-chambered heart results. In these the outlook of the patient is unsatisfactory, as might be anticipated.

Congenital aortic stenosis, though rare, should be easily diagnosed if evidence of aortic stenosis is found in a child under four years of age. After that age, rheumatic lesions become progressively more common. The author was much interested in a case which at age seventeen, showed a marked aortic systolic murmur and thrill, without any evidence of left ventricular enlargement, and in the presence of right axis deviation in the electrocardiogram. A congenital lesion of the aortic valve seemed the most probable explanation of these unusual findings, and when the patient subsequently died of tuberculous pneumonia, a bicuspid aortic valve was found. There was apparently sufficient obstruction to create the murmur and thrill, without any evident strain on the left ventricle.

A congenital lesion of much greater interest to students is patent ductus arteriosus. This duct, which is an integral part of the foetal circulation, and which normally closes soon after birth, runs from the commencement of the pulmonary artery to the isthmus of the aorta, just distal to the origin of the left subclavian artery. After birth, since pressure in the aorta is higher than in the

pulmonary artery in all phases of the cardiac cycle, there results a continuous flow of oxygenated blood from the aorta into the pulmonary artery and thence through the pulmonary circuit. This flow is often surprisingly great and has at times been estimated to amount to 75 per cent of the total left ventricular output. Some enlargement of both ventricles may be present, and the pulmonary artery is frequently prominent on x-ray examination. There are no significant electrocardiographic changes.

In this lesion, as one would anticipate, there is in the second left interspace a continuous murmur throughout systole and diastole, loudest at the commencement of systole, and decreasing throughout the cardiac cycle. A thrill is common, since the murmur is rough and often loud. The murmur has been called a machinery murmur, each surge having superimposed on it, the two heart sounds. Once heard, it is not forgotten. It is quite similar to the continuous diminuendo murmur heard over an arterio-venous shunt, due to a gun-shot wound or other cause. I recall blindfolding two students and having them auscultate while I applied the chest-piece of the stethoscope where the murmur was best heard over an anterio-venous shunt in a patient's thigh. They logically diagnosed patent ductus arteriosus, and their amazement and chagrin on the removal of the bandage was only exceeded by the merriment of their classmates. I have never dared to repeat this demonstration.

It is usually stated that the murmur of patent ductus arteriosus is loudest when the patency is relatively small, and less loud in those with greater calibre, that is with less obstruction to blood flow. Presumably, if the opening is minute, there would be insufficient flow to create a murmur. It is obvious that cyanosis is not found in this condition since all the blood returning to the heart passes through the lungs for oxygenation, at least once. If, as a terminal event in life, the flow through the ductus were reversed, then a brief terminal period of cyanosis could result.

A frequent complication of patent ductus arteriosus is subacute bacterial endocarditis. Cures were reported as early as 1939 by surgical ligation of the ductus. Latterly, the operation has consisted of applying two ligatures, and severing the ductus between them. This operation is meeting with marked success and is preferably performed between the ages of three and twelve years, in order to overcome present or future cardiac embarrassment, to prevent retardation of growth in the more serious cases, and to eliminate subacute bacterial endocarditis. There is evidence that in the cases which have not been surgically treated, penicillin alone may successfully cure subacute bacterial endocarditis. Prior to these modern forms of treatment, streptococcus viridans infection in patients with underlying patent ductus arteriosus, accounted for twenty-five to forty per cent of the deaths.

Another type of congenital heart disease, one which at present is much in the public eye, is Fallot's Syndrome or the Tetralogy of Fallot. Many "blue babies" are examples of Fallot's Tetralogy. Formerly, they remained "blue"; but again the surgeons have come forward and a successful operation changes the appearance

of these youngsters literally from "blue" to "pink," completely altering their expectancy and restoring them to physical activity. The result is dramatic.

As the name implies, the Tetralogy of Fallot is a combination of congenital lesions. There is present not only a patent interventricular septum, but also stenosis at or near the pulmonary valve. As a result, marked hypertrophy of the right ventricle occurs, and the aorta receives not only all the blood from the left ventricle, but overrides considerably the right ventricle as well. These four abnormalities constitute the tetralogy. A loud systolic murmur accompanied by a thrill is usually found in the second, third, and fourth left interspaces near the sternum. These findings are in part due to the pulmonary stenosis and in part to the flow of blood through the interventricular defect. The latter is, however, in the reverse direction since the right ventricle has in it much more blood than it is possible to force through the stenosed pulmonary valve. Right ventricular hypertrophy is so great that the pressure in this chamber exceeds that in the left ventricle, hence there is a flow of unoxygenated blood from right to left ventricle with each systole. Hence the cause of the patient's cyanosis even at rest, and which is usually accompanied by marked clubbing of the ends of the fingers. Many of these cases are cardiac cripples, handicapped by a variety of symptoms including dyspnoea, even on slight exertion. Their lives frequently terminate in youth, due to some intercurrent infection. A phenomenal case, described by Dr. Paul White, lived to be 59 years of age, and in spite of his disability was active as a composer of music. However, in his early days his parents were unusually devoted to his welfare, and he married a wife who carried on the good work with equal devotion.

X-ray examination of these patients often shows surprisingly little evidence of cardiac enlargement. On the other hand, in the electrocardiogram, right axis deviation is very marked. As a further guide in diagnosis, it is usually stated that if a patient with congenital heart disease who has marked cyanosis, reaches adult life, there is a seventy-five per cent chance of Fallot's Syndrome being present.

Surgical operation is performed on these cases where the diagnosis seems well established and where x-rays of the lungs show decreased blood flow. For the object of the procedure is to increase the flow of blood to the lungs where these organs have previously had a scant supply due to pulmonary stenosis. This is accomplished by creating an end-to-side anastomosis between one or other subclavian artery and one of the main pulmonary arteries, so as to improve the circulation to both lungs. Fortunately, the upper limb involved does not suffer from its altered blood supply. The operation is a delicate one, requiring special training and skill, and as a rule, is performed between the ages of three and eight years.

The next congenital lesion to be discussed is not in the heart but in the aorta, namely coarctation of the aorta. In these cases, narrowing, or even complete closure of the lumen of the aorta is present in the region of the isthmus, at or near the point of juncture of the ductus arteriosus. There is, therefore, no interference with the blood supply to the head or upper extremities. The supply, however, to

the arteries arising from the aorta below the level of the left subclavian artery would be insufficient were it not for an extensive collateral supply which nature provides through major channels in the anterior and posterior chest wall. Pulsation in these collateral arteries may often be felt, and sometimes a murmur is heard over them. Dilated intercostal arteries tend to cause a notching of certain of the ribs, which is a valuable diagnostic finding in the x-ray. In normal subjects, the blood pressure in the lower extremity exceeds that in the upper. In patients with coarctation of the aorta, hypertension exists in the upper extremities but is much lower in the lower extremities. Hence one should suspect the possibility of coarctation in all young patients who are found to have hypertension, and in each of these the blood pressure in the lower extremity should be recorded. It is by this means that the diagnosis is established. Seldom does one encounter a disorder so comparatively rare, where proof of the correctness of the diagnosis is so easily obtainable.

It is gratifying to know that successful operations have recently been performed on human subjects with aortic coarctation. The stenosed portion of the aorta is removed and an end-to-end anastomosis is done. It is advised that the upper age limit for such operations be eighteen years, in order to avoid difficulties arising from sclerotic changes in the aorta present in older individuals.

Pulmonary stenosis without interventricular septal defect is a rare lesion. While one would anticipate a diminished pulmonary artery shadow, the latter may be prominent due to an associated congenital dilatation of this artery. In pulmonary stenosis one would anticipate a rough systolic murmur and thrill in the pulmonary region, and x-ray and electrocardiographic evidence of right ventricular hypertrophy. Cyanosis would be absent.

Other congenital lesions which should be readily diagnosed include dextrocardia, primary congenital hypertrophy of the heart, and ectopia cordis. Dextrocardia should be borne in mind, for it is embarrassing to discover it in an x-ray, whereas palpation and auscultation frequently are all that are necessary for its diagnosis. The heart alone may be reversed (with or without other congenital cardiac abnormalities), or there may be a transposition of all organs, termed situs inversus. The chief importance of the latter diagnosis is that it aids in avoiding diagnostic errors where abdominal lesions develop. Particularly, one must remember the abnormal position of the appendix and gall-bladder. In dextrocardia, without other cardiac abnormalities, the electrocardiogram is usually diagnostic in that the first lead appears inverted, and leads two and three are interchanged, always assuming that the right and left arm electrodes have been correctly applied.

On rare occasions the newborn are found to have abnormally large hearts without any obvious explanation. This condition is termed primary congenital cardiac hypertrophy. Also rarely, the heart is found in some abnormal position, such as below the diaphragm: hence the term, ectopia cordis. These abnormalities are mentioned only because they belong to the group of congenital cardiac defects which should be recognizable during life. There are many other varieties

and combinations of defects whose nature, as yet, is demonstrable only at necropsy.

It is obvious that murmurs play an important part in aiding us to diagnose several, but not all, types of congenital heart disease. Students should, however, first become familiar with murmurs which are typical of acquired valvular lesions, namely those of aortic stenosis, aortic regurgitation, and mitral stenosis. A systolic murmur in the mitral area is more difficult of interpretation, but its location does not suggest congenital heart disease in any event. If murmurs are found which could be interpreted as being due *either* to rheumatic *or* to congenital heart disease, it is wise to remember the much greater incidence of rheumatic lesions.

Before leaving the subject of congenital heart disease, reference should be made to a new and helpful method of investigation of these and other cases by cardiac catheterization. A specially designed catheter is introduced through a suitable vein in the arm (or leg), and followed by fluoroscopy until its tip has entered the heart. Actual pressure readings, and measurements of the oxygen content of the blood contained in the venae cavae, right auricle, right ventricle and pulmonary artery may then be made. It is obvious that in congenital lesions this method of examination may prove of great assistance in determining more accurately the exact abnormality which is present. For instance, if a significant rise in oxygen content is found in the blood in the right auricle as compared with that in the superior vena cava, it would indicate a flow of oxygenated blood from the left auricle through a septal defect. Similarly arterial blood would be detected in the right ventricle if it gained entry from the left ventricle, or in the pulmonary artery if a patency of the ductus arteriosus existed. Pressure readings are also of value, an example being the sudden drop in pressure in the pulmonary artery in patients with pulmonary stenosis. In addition, it will be evident that where there are septal defects, it may be possible to introduce the catheter into the chambers of the left side of the heart. If this subject is further pursued, estimates of the amount of blood flow misdirected in various congenital lesions can be made, and this quantitative information may be helpful under certain circumstances in assessing the severity of the lesions.

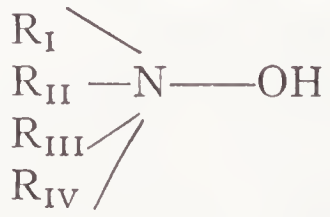
It is hoped that enough has been said concerning congenital heart disease to interest the reader in a field which, though limited, has a peculiar fascination, and which attracts not only those concerned with the basic medical sciences, but also the practicing physician, and latterly, in addition, the surgeon. How wide an application the considerations involved may yet have in the more general field of cardiology, is an interesting speculation.

CURARE

ROBERT GRAHAM 4T8

CURARE is a drug that has been known more or less as a curiosity for some three hundred and fifty years. However, even in the present day the lay public and, unfortunately, many who should be better informed, consider curare as a mysterious and awesome drug associated as an arrow poison of the South American natives. It was as an arrow poison that Sir Walter Raleigh referred to curare in 1595. Some two hundred years later several Europeans, among them Humbolt, saw the poison prepared, and indeed, Humbolt even identified the chief ingredient as a plant of the strychnos series and named it strychnos toxifera. Later observers remarked on the multiplicity of the plants in the brew and noticed that in different regions of South America completely different ingredients were used. Of course, such a variety of factors would produce and did produce a wide range of end products with widely varying pharmacological properties. Consequently, the early investigators reported results that were completely obscured by side reactions, and a great muddle of facts that would not be correlated began to pile up. Recently this snarl of fact and fiction began to resolve itself, as more nearly pure extracts of the drug were obtained so that in the last twenty years or so, a reasonably clear picture of the chemistry, pharmacology, and clinical uses of curare has emerged.

Curare belongs to a vast array of substances that are grouped as quaternary ammonium bases, that is a substance which has the general formula of:



And R_I R_{II} R_{III} R_{IV} are any groups of radicals alike or different attached to the nitrogen atom. Hence a long list of compounds is available to comply with this formula: to mention a few—quinine methochloride, erythroidine, choline, muscarine, snake venoms, strychnine, and of course, curare. Now all these compounds have widely varying empirical formulas and it is believed that the curiously similar pharmacological effects of these compounds is due to an overall similarity of the complete molecule, that is to say, their effects are due rather to their stereochemistry than to their atomic make-up.

To understand the action of curare it is necessary to review the action of the neuro-muscular mechanism. When Claude Bernard showed that the curare effect depended on neither the changes in the nerve fibre nor the muscle mass per se, he postulated a third structure, namely, the myoneural junction. We now believe the transmission of the nerve impulse from nerve to muscle to be a functional rather than an anatomical concept and we go further in believing this transmission to be entirely analagous to impulse transmission at the synapse, that is to say, the present concept of the myoneural junction is an electro-chemical transmission of the nerve impulse.

The presently accepted theory of this electro-chemical transmission of the nerve impulse is briefly this: acetyl choline is present throughout the entire functioning nervous system, and cholinesterase is an enzyme which causes hydrolysis of the acetylcholine and indeed causes its destruction in the time which would be compatible with the speed of nervous impulse transmission. It has been proved that both acetylcholine and cholinesterase are present at the surface of the nerve and that they are in appreciably greater concentrations at the regions of the synapse. Furthermore the electrical potential can be predicted by the concentrations of the enzymes in the region.

Now the importance of finding acetylcholine and cholinesterase at the surface of the nerve is that the nervous impulse, the fluctuation of electrical potential, this bio-electric phenomenon,—all terms are synonymous—occurring at the surface of the nerve may be simply considered to be a reshuffling of the surface ions, and acetylcholine can be shown to disturb the resting potential at the surface. Our next presumption is theory or rather an outright guess; we may suppose that curare as well as many of the quaternary ammonium bases, of which I have enumerated a few, have the ability to distort the surface pattern on the nerve so that acetylcholine can no longer exert its power to reshuffle the surface ions so that no longer can a disturbance of electrical potential be set up. Now whether this block is set up in the nerve fibre or in the functional myoneural junction is unimportant from the standpoint of the action of curare.

Although in the last half of the 19th century curare was used more or less satisfactorily in France in the cases of hydrophobia, tetanus, epilepsy and chorea, the results were never uniform, the drug standard almost unknown and the whole procedure fell into more or less disrepute. In the last twenty years the purity of the drug has become reasonably constant so that animal experiments were undertaken. West (1) in 1930 found that curare in sub-paralytic doses could control tetany, while allowing the dogs to move about freely. Five years later, Gautrelet and Halpern found that curare together with ethyl cyanide and hemolymph would antagonize the inhibiting effect of acetylcholine on the isolated heart of Helix pomatia,(a snail). By 1938 Fegler and Kowarzyk (3) demonstrated a seemingly reciprocal antagonism between physostigmine and curare explaining its action by supposing that curare, physostigmine, and acetylcholine together with other quaternary ammonium bases possess the property of combining with the cholinesterase, and simultaneously with elements of a receptive nature in muscular tissue. Therefore the activity of each substance would depend on how great the affinity for the cholinesterase compared with the affinity for the receptive substance.

In 1944, McIntyre and King (4) found that in the turtle heart an extract of curare did not interfere with the liberation of the vagus substance. Moreover they found (5) that were curare was added to a muscle preparation—frog's gastrocnemius—and this was then stimulated, the preparation lost more potassium than a control muscle preparation by over 100 per cent.

The effect of prolonged administration was studied (6) by investigators who found that death occurred in dogs from 8-15 hours and the cause of death was

some cardio-toxic substance. If, however, instead of paralytic doses, only enough curare was given to keep the animal quiet and the drug administered so as to allow no accumulation the dogs could be kept alive up to forty-five hours.

To investigate possible antidotes for curare poisoning, Koppanyi and Vivino (7) conducted experiments to demonstrate that small combined doses of the anti-cholinesterases such as ephedrine or tyramine were effective.

Gross and Cullen (8) in the hopes of investigating the effect of curare on the gut (for the possibility of curare's use in anaesthesia was surmised) found that without premedication there was a varying degree of cessation of peristalsis in the small gut dependent upon the use of curare. They further found that with appropriate preaneasthetic sedation by morphine that no appreciable loss in tone of the gut occurred.

With regard to the possible clinical uses of curare, it is of special interest to Canadians that it was due to the efforts of the reknown Canadian doctors, Griffiths and Johnson, who had the foresight and the courage to use this South American arrow poison on human beings, that curare was to emerge as a therapeutic agent of great promise.

In considering what clinical advantages curare might have we consider its property of paralyzing voluntary muscle and thus producing more complete relaxation. It is essential of course to have as complete relaxation as possible in surgery. Up to the present this has been obtained by the use of perilous quantities, in some cases, of the anaesthetic agent used. H. R. Griffith, using the Squibb (9) product, intocostrin, performed major operations with cyclopropane as the anaesthetic agent. The only disadvantage of the procedure was a mild and temporary respiratory depression which soon wore off and was easily controlled by artificial ventilation. Curare was used thus in a series of one thousand cases whenever the need for complete relaxation was paramount, that is primarily in upper abdominal and in pelvic surgery. Cullen's method (10) of administration of curare was to take the patient to the second plane and level him off there, then he administered intravenously intocostrin, and made the incision, thereby getting the maximal relaxation which occurs in some two minutes with curare given intravenously. The anaesthetic agent used was, for the great majority, cyclopropane, although he used nitrous oxide, and also ethylene, the latter having the distinct disadvantage of producing a marked cyanosis.

The next clinical use of curare was in controlling the convulsions of both metrazol and electic shock therapy in certain psychiatric disabilities. Bennett(11) used curare as an important adjunct to shock therapy because of the high incidence of fractures in this therapy; indeed he reports up to 50 per cent fractures of the vertebra in one series of cases. Wolfe (12) showed that in a series of a thousand patients, many of whom were bad risks for shock therapy, that even without any type of restraint the treatment could be given with no danger of orthopaedic injuries, although in some cases it was necessary to carry out artificial respiration.

A further clinical use is to resolve muscle spasms and rigidity. Denhoff and Bradley, taking advantage of the paralytic effect of curare, attempted to overcome the contractions of voluntary muscle in cerebral palsy. These investigators

took six children ranging in age from six to twelve years of age and gave them a dose of from .9 to 3.3. mgms. per kilo body weight intramuscularly in the buttock. This dose spaced at four day intervals gave a pronounced alleviation of the spasticity thereby allowing the children a period of increased ability to be trained, better performance and clearer speech.

It was only a question of time until someone revived the French idea of treating convulsions with curare. Cullen and Quinn (14) on a case of tetanus which was responding most unfavourably to Avertin treatment used sub-paralytic doses of intocostrin. The patient, who had by the end of 48 hours' treatment with Avertin developed a pulse of 150, a temperature of 104 degrees, with respirations 48 per minute, and with signs of pneumonia with consolidation of a lobe was given curare intravenously with spectacular results. Up to the use of curare, the patient, who with each convulsion went through paroxysms of extreme agony on administration of the drug, was able immediately to relax and became wholly co-operative. In 18 days the patient was well enough to be discharged.

The last use I shall discuss is the use of curare in diagnosing cases of incipient myasthenia gravis. It is now believed that perhaps the cause of this condition is the circulation of a curare-like substance in the blood stream. Whatever the cause of the disease the administration of curare will greatly intensify the symptoms greatly aiding diagnosis (15).

The writer has attempted to briefly review some of the more modern literature available on this interesting drug. Its uses are still being discovered. None of the researchers hail this drug as a panacea, but they all feel that curare will prove itself an useful and important adjunct to existing techniques.

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FOLIC ACID IN THE TREATMENT OF PERNICIOUS ANEMIA

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The name folic acid was first applied to an extract of spinach that proved to be a growth factor for streptococcus faecalis. This extract is necessary for the growth of Lactobacillus casei. Substances of this type have been found in the extracts of a number of leafy plants and liver and yeast. Various investigators using different animals demonstrated the presence of a new nutritional fraction in Vitamin B complex. A variety of names were given to this factor or factors including folic acid, Vitamin M, Vitamin Bc, Vitamins B10, B11, "elvate factor" from liver, and L. casei factor. The identity of all these factors has not yet been proved and a great deal of research remains to be done. An interesting summary of their relationships as understood at present is given by P. H. Thompson in "The Folic Acid Story" in C.M.A. Journal, 1947.

Synthetic folic acid which has been used for the treatment of pernicious anemia is identical with that isolated from liver as the "L. casei factor." It is called Pteroyl-glutamic acid and is a compound of 2-amino-4-hydroxy-6-methyl pteridine and p-aminobenzoylglutamic acid. It resembles the extract of spinach, in being active for both streptococcus faecalis R. and Lactobacillus casei, and may be identical with it.

Curative effects in cases of anemia of substances now known to contain folic acid have been reported in the past, and anemia associated with Vitamin B deficiencies has been studied. Also, the fact that synthetic folic acid relieves the hyperchromic anemia with megaloblastic hyperplastia of the marrow and leucopenia of "Vitamin M" deficiency in monkeys suggested its use in the treatment of anemias. Folic acid has been used successfully in the treatment of Addisonian Pernicious Anemia, Nutritional Macrocytic Anemia, Steatorrhoea, and Macrocytic anemias of pellagra and pregnancy. Its use in other haematological disorders has not been established. In general it appears to have been beneficial in those types which respond to liver. In anemias where the bone marrow shows megaloblastic change, folic acid is found to be effective therapeutically. The clinical evidence of the activity and optimum dose has been accumulating rapidly. Folic acid may be taken by mouth or parenterally. As much as 400 mg. has been taken by mouth in one dose with no ill effects. In one case of Addisonian P.A. in relapse, a dose of 2 mg. parenterally each day for 20 days proved to be effective. The effective dose suggested as optimum is about 20 mgms. per day orally or intra-muscularly, during relapse. Enough evidence has not yet accumulated to decide the maintenance dose. Suggestions for a maintenance dose vary from 70 mgm. per week to 20 mgm. every three weeks. Evidence is accumulating that the neurological complications of Addisonian Pernicious Anaemia are not relieved, or prevented by large doses of this substance, and that its use as a substitute for Parenteral Liver Extract is not justified. Certainly in tropical sprue it seems to be equal to liver therapy, in that the improvement in the formation of stools and the well-being of the patient is very marked.

The relationship of folic acid to the "extrinsic" and "intrinsic" factors of Castle is not yet established. It cannot be the "extrinsic factor" because it is effective given orally in the absence of the "intrincic factor." It is also effective when the "extrinsic factor" was eliminated from the diet. Therefore it is not the "intrinsic factor." The anti-pernicious anemia factor in liver contains a minute amount of folic acid. Since this is too small in relation to the therapeutic effect, some other substance is responsible. It seems that folic acid is effective in pernicious anemia but otherwise unrelated to the "intrinsic" and "extrinsic" factors of Castle or the anti-pernicious anemia factor in liver.

Remissions in a few cases of Addisonian Pernicious Anemia in relapse have been obtained by large doses of thymine. The relation of thymine to folic acid is not significant clinically as such relatively large doses are required to give the same effect. (About 1200 times as much.) But this is of great interest in the theoretical relations of all these factors. The biochemistry of hemopoiesis still needs completing and promises discoveries which will lead to even better therapy.

I wish to thank Dr. K. J. R. Wightman for his helpful criticism.

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PSYCHOLOGICAL FACTORS INVOLVED IN NORMAL PREGNANCY

H. S. WASMAN

OBSTETRICS offers a unique opportunity to study the "animal" nature of the female, using "animal" in the broad biological sense. Pregnancy and childbirth are elemental; they "reduce" a woman to the level of her brute sisters. Of this, sensitive women are not infrequently aware and vaguely resentful. However, I think it is reasonable to assume the desire for a child basic in every women: her biological destiny is child-bearing and at least to some extent, child-rearing—however much this may be denied. The basic psychosexual status of woman may be considered as follows:

1. The urge to reproduce the species.
2. Pregnophobia.
3. The maternal "instinct."

The second is in direct opposition to the first and the last, hence, the cornerstone of female psychology is unstable with a constant source of conflict. Additional factors acting to produce the particular reactions of pregnant women may be grouped as follows:

1. Physical discomfort and pain with their resultant fear and anger present potential elements of psychic disturbance.

2. The impact of pregnancy itself with its socio-economic implications, as well as, of course, whether or not the pregnancy is desired.

3. Toxins, exhaustion, hormones, etc., which act as certainly on psyche as on physiology, as we of the dawning "psychosomatic emphasis" (so readily!) admit.

To be sure, the influence of these factors varies from slight to profound. The stolid bovine type shows little response, the majority show some type of abnormal reaction, especially primiparae during the first trimester—such as:

1. Antipathies and aversions, seen often as craving for unusual and occasionally abnormal articles of diet—the greater the parity, the less the craving. While satisfactory explanation of such anomalies is not at hand, they may be the expression of an unsatisfied primarily physiological need.
2. A changed, or more often, changeable disposition.
3. The mild nausea, the vomiting, and the rarer ptyalism have a psychogenic as well as toxic and possible hormonal basis, since numerous case reports demonstrate complete relief of symptoms by an attempted but unsuccessful abortion, after which the patient was deliberately deceived.

Many pregnant women are more impressionable. DeLee noted that in olden time pregnant women were considered mentally irresponsible because of their increased suggestability. Today they are not considered reliable as witnesses for

as one author expresses what he thinks is the case, "their perception is less acute, their reasoning deficient, and their interpretation false." Yet rather than a certain dullness of intellect associated with pregnancy, it would seem more likely that the woman's thought and feeling is concentrated on the approaching birth and its consequences, and that this focus is responsible for the relatively greater indifference to the environment seen at this time.

Probably there are almost as many women as there are men who never grow up psychologically! One may find a woman angered at the thought of her pregnancy—such anger being aggravated by her inability to avoid its consequences or transfer it to her husband whom she accuses as responsible for her conditon. Yet confronted by such a woman, lest we accuse her unjustly, we must remember that a pregnant woman lives in the midst of anxieties and fears, many of which are dim and undefined, coming down the long road of the race's superstition-laden past. Of course, the degree of such fears, or perhaps, more accurately, their expression, may be mitigated by environment and education. I need scarcely remind you of the types of anxieties most common—fear of expense involved, and the financial strain of another mouth to feed, fear of the loss of independence, fear of the responsibility of bringing another into a chaotic world and of being unable to rear it properly, fear of forfeiting the husband's affection by loss of attractiveness, fear that the child will inherit undesirable familiac traits, etc. However, one fear I do not hesitate to elaborate—the fear of the dangers and pain of pregnancy and labour, so well exaggerated by "old-wives' tales," and the ill-advised publicity found in the lay press of the morbidity and mortality associated with having a child. In few other fields is superstition more rife and ignorance more profound, and with such harmful results. It is notorious that informal gatherings of women tend, as the afternoon wears on, to become obstetric clinics, usually, of course, of the abnormal. Why older women delight in frightening young women pregnant for the first time with obstetric tales of horror, or by solemn but silly admonitions is hard to say.

Despite the physical discomfort, despite the fears, most pregnant women after the first few months are content—some seem even able as the poet said "to walk in radiance like a bride." But to state that this is so because the pregnant woman is "fulfilling her destiny" is grossly simplifying a physical and psychic re-adjustment of whose essential mechanisms we are almost entirely ignorant.

II. *Psychological aspects of :*

1. Hyperemesis
2. Pseudocyesis
3. Illegitimacy
4. Abortion.

1. *Hyperemesis*

With regard to the pathogenesis of hyperemesis, Schultze and Rhonhof believe that both organic and functional causes are involved but they consider functional factors the more important in most cases. That organic factors are

involved is probable and is indicated for example by the frequent occurrence of vomiting before knowledge of pregnancy. These authors suggest that pathological vomiting results from the "sensitization of the vomiting and vagal centres by 'toxins,' decreasing the threshold so that various psychic influences lead to vomiting more easily. They defend their emphasis of the functional factors involved by the following observations: (1) that there is a higher incidence among primiparae (where conflicts and fears are relatively stronger); (2) that, according to their studies, vomiting is rare in more stable women; (3) that vomiting becomes manifest to a greater extent upon knowledge of the presence of the pregnancy.

As you know, the psychogenic component, according to some psychological schools, is associated with the wish not to become pregnant and that consequently, quite unconsciously (naturally) the woman wishes to rid herself of the offending fetus. Psychoanalytic parlance would put it in this way—that childhood fantasies suggest that pregnancy occurred by way of the gastro-intestinal tract so that the expulsion of the fetus is thought of in the same way—that education on the anatomy of the internal organs does little to alter the vague childish concept of babies growing in the stomach and therefore, unconscious mental forces vainly attempt to expel the baby by vomiting. However, as far as I could determine, neither the psychoanalytic nor the various other theories claiming an exclusively organic or functional genesis have been found noticeably useful therapeutically. Hence, in this paper, I shall only draw to your attention that treatment of the emotional factors involved, regardless of the particular pathogenesis to which one subscribes, may be approached as follows:—

A. prophylactically, by adequate sex instruction of children, and avoidance of the concept of "morning sickness" as an inevitable complication of pregnancy,

B. immediate treatment, by isolation in a quiet room with exclusion of all relatives and friends if the case is severe.

2. *Pseudocyesis.*

Good, in 1823, first coined the term from pseudes and kyesis (false pregnancy). Writers from Hippocrates to contemporaries have lavished on the syndrome adjectives that vary from "brain pregnancy" to "wind in the bowels." Today we admit that there are no "false pregnancies," merely false diagnoses and define the condition as one in which signs and symptoms of pregnancy appear, presenting in some cases a clinical picture so exact as to deceive both patient and physician. Bivin and Klinger reviewed the 444 reported cases from Hippocrates to 1937, finding that:

(1) the age of 33 represented the mid-point of distribution with a range of 17 to 50 years;

(2) that 83% were married, 15% unmarried, 2% widowed; and note that it occurred most often in second marriages where the first had been unfertile;

(3) that 37% had had previous pregnancies and 5% proceeded through true pregnancies later;

(4) that no common etiological factor was demonstrable but that the psychological factors of importance were fear, desire and hysteria.

With regard to the clinical picture they found the following common to most cases:

(1) amenorrhea,

(2) enlargement of the abdomen at a rate approximately that of normal gestation presumably due to flatus (fatty degeneration of the omentum), etc.,

(3) nausea, capricious appetite and vomiting especially prominent,

(4) a duration usually about 9 months—one reported case lasted for 18 years, surely a desperate plight!

3. *Mental Attitude Towards Illegitimacy.*

In an era not long gone, an illegitimate pregnancy was considered a grievous sin; society branded the woman with the traditional scarlet letter. Within recent years, the value set on virginity has diminished—apparently. It appears possible that many young women today regard illegitimacy evidence of poor technique or poor judgment rather than a sin; indeed, the fear of parental anger or disappointment and family disgrace appears far stronger than any sense of personal shame. From this, one might conclude that illegitimacy per se causes relatively slight mental trauma and this appears to be the case in a majority. With regard to the reaction to the man involved, one finds a remarkably useful mode of adjustment in the "helpless" female for there is considerable truth in the words of the cynic who said that women have a strange capacity "to love the unloveable, to cherish the unlovely, and to defend the indefensible."

4. *Mental Attitude Towards Abortion.*

So often one hears that moral scruples are on the wane. Yet the Russian experiment (if it may be so dignified) has increased rather than diminished, among physicians and a considerable proportion of the educated lay population, conviction as to the danger of abortion to the life and health of mothers. Anthropological research has shown that most primitives had no compunction in terminating pregnancy by abortion just as there was little feeling against infanticide. Of course, primitives we will always have with us. Then, too, we must remember that many women, in some matters at least, are realists, less concerned with principles than with results, hence, little impressed by the illegality of something they may desire. One must admit that today a considerable percentage of women do not hesitate to employ abortifacents or if they do hesitate, manage to overcome any doubt or vaccilation with such success that abortion today is "big business." Again, abortion per se, appears to cause no mental trauma of importance—of course this is debatable.

III. *Psychopathology of Pregnancy*

1. *Psychotic reactions.*

A. (1) History

The fact that definite mental illness may complicate child-bearing is an ancient observation. Galen recorded instances of puerperal psychoses; Hippocrates believed that such illness was due to suppressed lochial discharge or a diversion of milk to the brain. The literature of the next 1,000 odd years contains little but recitals of unchecked myths and a few case reports of "puerperal intoxication," "insanity of pregnancy" or "insanity of lactation"; dozens of intriguing court cases of puerperal "criminology" are found in the nineteenth century reports. No attempt was made to classify, except on the basis of the period of child-bearing in which it occurred, until the first quarter of the twentieth century when various authors demonstrated clearly that no specific mental disorder occurred only in relation to child-bearing, the literature of this period being largely concerned with the reclassification of such mental complications into the accepted scheme of psychiatric diagnoses.

(2) *Incidence of psychotic reactions.*

Numerous attempts have been made to ascertain the rate of occurrence but reports vary, for example, from 3% to 22% of admissions to mental hospitals due to post-partum mental disorders. While most of the statistics indicate that approximately 8% of female admissions to mental hospitals are due to mental disease associated with childbirth, this gives no indication of the actual incidence since many women have a mild or transitory psychosis or toxic delirium from which they recover at home or in a general hospital. The findings of attempts to approach the problem of incidence from the frequency of mental disorders during pregnancy in relation to the total number of deliveries, have varied from 1 psychosis in 80 deliveries to 1 in 2,000; nor has such discrepancy been satisfactorily explained in terms of community economic level, illegitimacy rate, or social unrest of the period, etc. In short the relative frequency of mental disease associated with pregnancy is unknown. The "accepted" rule is one complicating mental disorder in 400 deliveries but this, as far as I can ascertain, has little except tradition for support.

(3) *Etiology.*

If you will permit, I think a brief preamble regarding the etiology of mental disorders in general might clarify our thought in this field.

Mental disorders are most usefully understood as inferior and maladapted patterns of reaction designed to meet biologic, sociologic and personal problems confronting the individual rather than constituting specific disease entities. If the resources of the personality are sufficient to deal competently with the various threats to mental integrity, the individual remains "normal." Those who have inadequate personal assets and/or who are subjected to an overwhelming load, are unable to cope with the situation in the usually accepted manner responding

with behaviour patterns poorly adapted to efficient social adjustment and are therefore termed "abnormal." The exact type of reaction pattern then, depends upon a complexity of factors, some constitutional, others determined by training, experience, habitual modes of thinking, etc. To remain "normal" throughout a pregnancy, a woman must react to a series of physiologic, psychologic, and social stresses in the orthodox manner. As we have seen, even an uneventful gestation imposes a test of stability. Any disturbance, whether a mental conflict or organic illness, lessens the patient's capacity to control her emotional and constitutional tendencies to some form of mental disorder. The exhaustion of labour, the metabolic adjustment of lactation, and the mild toxaemias are further predisposing causes probably operating, at least to some extent, by so reducing the clarity of consciousness and degree of self-control, that underlying pathological trends of behaviour and thought are expressed. However, it is instructive to note that only a small proportion of patients are reported who have had a definite history of unusual physical depletion except in cases of toxic delirium.

As for the twentieth century vogue of attributing any unspecific disorder to a possible hormonal imbalance, I admit that this has been done but at present I could find no evidence whatever to show that this is of any significance in the production of mental disease associated with pregnancy.

B. A review of a series of 88 psychoses associated with pregnancy and the puerperium admitted to the Toronto Psychiatric Hospital revealed the following:

(*a*) As regards incidence:—

1. About 3% of all psychoses in women occur in relation to childbirth.
2. That psychotic reactions may occur at any time during the childbearing period with the average age of 28 years, corresponding roughly to the most fertile period.
3. With regard to the number of pregnancies, 50% were primiparae and 50% multiparae.

(*b*) As regards etiology:—

1. Thirty-two per cent had demonstrable neuropathic family history most marked in the manic depressive group and least significant in the toxic exhaustion group.
2. That 73% of the 88 cases had the first attack of mental disease associated with pregnancy.
3. That regarding time of appearance, the onset of psychosis occurred during gestation in 15% of cases, 85% being post-partum.
   (i) Antepartum cases were 40% in the toxic-exhaustion group frequently associated with infection and toxaemias especially between the sixth and ninth months, 29% were manic-depressive, 23% schizophrenic.
   (ii) Labour cases were 20% toxic exhaustion, 21% manic-depressive, 10% schizophrenic only occasionally associated with prolonged labour, forceps or operative delivery.

(iii) Puerperal cases were 85% toxic exhaustion occurring usually around the sixth day, again infrequently associated with sepsis.

(iv) Anxiety neuroses became manifest about the twentieth day post-partum.

4. That etiological factors of importance were largely psychogenic—fear of labour, economic problems, conjugal dysharmony, still-birth. However, the delirium, a feature of considerable percentage of the psychoses associated with child-bearing, suggests that toxic factors must be considered since delirium cannot be explained away wholly on the basis of psychological conflict.

(*c*) As regards *diagnosis*, 38% were placed in the toxic exhaustion group, 33% manic-depressive, 26% schizophrenic.

(*d*) As regards *clinical syndromes*:

Because of the marked variation in the prognosis of the various groups described, it is important to establish the diagnosis accurately.

The toxic exhaustion group is marked by a relatively abrupt onset, signs of infection, or physical exhaustion, and delirium. The delirium is characterized by confusion, inadequate perception, and, usually, hallucinations. In the T.P.H. studies, 80% were reported hallucinated in the auditory field and 45% in the visual field. Affective or schizoid symptoms may appear but where there is a clouding of consciousness one is not justified in diagnosing at the time any other than toxic-exhaustive psychosis.

The manic-depressive group contains not only the clear-cut syndromes but also manic or depressive conditions following subsiding delirious states. Frequently the onset is marked by confusion and disorientation, this occurrence explaining the unusually high incidence of hallucinosis in the manic-depressive group associated with pregnancy; in the T.P.H. study the incidence of hallucinations was three times that of other series of affective psychoses.

The majority of the schizophrenic group presented little difficulty in diagnosis.

(*e*) As regards *course and prognosis:*

1. Of the 32 exhaustion cases, the average duration of illness was ten weeks, twenty-five reported recovered (of these four had uncomplicated pregnancies), 2 improved, 2 transferred to an Ontario Hospital.
2. Of the 28 manic-depressive cases, the average duration of illness was four months, 22 reported recovered, 5 improved, 1 transferred to an Ontario Hospital.

3. Of the 22 schizophrenic cases, the average duration of illness was one year, 5 reported recovered to the extent of social remission, 5 improved, 10 transferred to an Ontario Hospital.

(*f*) The *treatment* of the acute confusional hallucinated case is a clinical emergency requiring concentrated attention. Because they are often resistive, restless and suspicious, refusal of food and fluids is common. During this period the administration of adequate nourishment and particularly adequate fluid is essential. In the toxic group, immediate attention must be directed to the discovery and treatment of any toxic focus. Yet along with the panic, sudden distrust of relatives, sing-song jargon, etc., of the manic, rapid pulse, tremor, quick dehydration and fever from 99 to 102 degrees are frequent manifestations and complicate the physical evaluation of the puerperal patient. Control of excitement may be usually accomplished by continuous baths and the judicious use of sedatives.

Psychiatric hospital care should be advised early in the depressed case for protection of both patient and infant. When a degree of rationality is observed, psychotherapy may be instituted.

With regard to indications for therapeutic abortion and the advisability of further pregnancies, there are, as elsewhere, no absolute indications; consideration must be given in each case not only to the particular disease entity presented but to its severity, usual course and the general condition of the patient.

2. *Neurotic Reactions.*

The literature of mental disease associated with child-bearing maintains a careful silence as regards neuroses except for the one prolific psychologic school of our period. However, there are a few matters of sufficient importance for brief mention in this paper. Frequently one hears the comment, "I was perfectly well until our first child was born," or "I haven't had a well day since the birth of my youngest child." Now what do such remarks mean? Usually that the woman has sought expression of her dissatisfaction with life in terms of popular fancies concerning parturition—"children spoil your figure, they tie you down, sap your strength"; "nursing weakens you," "giving birth to a child tears you to pieces—you are never the same down there." Some women, after giving birth, feel as though they have done their bit for the rest of their lives. They never "get their strength back" because they never could assume much responsibility. By means of invalidism they avoid further pregnancies, marital responsibilities and are able to live a thoroughly self-centered life, controlling their environment by illness.

When a woman says, "Having a child sapped my strength," physicians must think not only in terms of anemia, glandular inadequacies, uterine displacement, lacks of vitamins, etc., and ignore the possibility that she may be referring to lack of emotional strength and enthusiasm about her job as a mother.

Too often children are brought up in an atmosphere of "Don't bother mother, she is not very well," or "Don't make any noise, dear, mother isn't very strong," or worse still, "Mother had such a hard time when you were born, she hasn't had her health since." I shall restrain any tendency to suggest that such an environment is materially destructive to the mental vitality of the growing child, but I do venture to point out that it is a potent factor in weakening the adequacy of the adjustment of the young girl to her future pregnancies.

That the relationship of a woman to her mother is an important factor in her psychological adjustment to pregnancy can be testified by any family physician. In general, one might say that there are three more or less normal types of mothers.

First and worst is the mother who sublimates "her all" in the daughter, waiting upon her hand and foot, often to the extent that the daughter is unable to perform the simplest domestic tasks—"mother always did everything for her." Minor disaster results when (usually after years of frustation in trying to discover a man who can meet her mother's requirements) such a daughter is thrust into association with a man accustomed to the self-dependency and "team-work" of male life. The anguish and terror of such a woman confronted by a labour, when she realizes that neither her husband nor her mother can have the baby for her is pitiable.

The second type of mother, through that rare commodity we blythly term "common sense" or through necessity, follows the natural law of teaching the fledgling to fly and then making it depend on itself. The daughters of such mothers are by far the best balanced and certainly the most capable mothers.

The third type, which constitutes the smallest group, although far too common, is not a mother at all; her egocentricism ejects her unwanted child from her life at the earliest feasible moment—needless to say their children are never breast-fed and we well know the frightening consequences of that malpractice! The daughters of this group present a high percentage of abnormal psychologic variants furnishing many a troublesome headache for the medical profession.

IV. *Conclusions.*

While "husband and family trouble" is essentially of psychologic origin and nature, the psychiatrist rarely has the opportunity to deal with the problem until it is far advanced and usually incurable. The gynecologist and obstetrician, on the other hand, is in a position to perform a valuable function in the field of preventive medicine as his contact with such problems is relatively early. From the obstetrician's standpoint, reasonably adequate sex education and psychologic preparation for pregnancy can be accomplished in a relatively brief time provided that the patient's mentality is not entirely hopeless. Where possible and always where the patient is found requiring special psychologic care, the tact and co-operation of the husband and family should be elicited.

Although it is obvious, one point I would like to make as it is too often neglected, is that while it is useful in the compilation of a gynecological and obstetrical history to be able to record a "difficult" labour, delivery by breech, etc.,

the good physician will be judicious about the sort of woman to whom he recounts such a history.

Thorough routine prenatal care serves to prevent and minimize many of the factors causing toxemia and exhaustion; this in itself diminishes psychiatric morbidity to some extent, yet, by more adequate attention to the ante-partum mental status of the patient, more wholesome psychological adjustment would no doubt be possible; furthermore, such care would serve to detect early psychopathology. The inclusion of such attention into the routine might appear to be hardly worth the effort entailed considering the relative infrequency of psychotic disease associated with pregnancy, but the actual incidence of unsatisfactory adjustment to pregnancy and its resultant discontent and unnecessary misery as well as the parturition as a neurotic excuse precludes such a conclusion. It is a truism that every good doctor is a psychotherapist but as Dr. Farrar has said, "It should be still more widely practiced and more consciously and scientifically applied." The medical tradition of seeking physical causes for all symptoms and the recognition of many physicians of the inadequacy of their knowledge of psychology are chiefly responsible for the busy physician becoming subject to a sort of psychophobia which seriously impairs his therapeutic efficiency. It is as much an error to think that psychological problems must necessarily be referred to the specialist, as to think that psychological processes may be safely disregarded as an unimportant part of the total medical picture.

It has been the purposes of this paper to elucidate first some of the factors involved in the normal pregnant woman; second, to indicate where psychogenic factors are significant in hyperemesis, pseudocyesis, abortion, and illegitimacy according to medical thought of today; third, to suggest the factors concerned in the psychopathology of pregnancy in order to implement early diagnosis and appropriate care.

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Feature

R. K. GRAHAM, Editor

WHAT DO WE DO WHEN WE HAVE QUALIFIED?— THE GENERAL PHYSICIAN IN CANADIAN PRACTICE

J. A. MACFARLANE, O.B.E.
Dean of the Faculty of Medicine

I AM very glad to have the opportunity to address the students of the Faculty of Medicine at the beginning of another session. Your Editor has aked me to say something about the problems of practice in relation to the undergraduate who is thinking of his plans for establishment after qualification. Since assuming the duties of administrative head of the school I have been extremely interested in the various motives which lead young men and women to seek enrolment in medicine. May I first say that I am not impressed by the average maturity of thought and ability to gauge the problems involved in such decisions, which are shown by the students who come up from the high schools. A variety of reasons are given when a student of seventeen or eighteen is asked why he wishes to be a doctor. He says he "likes people," when it is obvious that he can know scarcely anything of human reactions. He has "wanted to be a doctor since the age of six"; he wants "to do research" because of having read interesting books on biology; he regards a doctor's life as "the most promising from the point of view of attaining independence or social position." Not a few have decided at the age of eighteen that they will be psychiatrists. A small number say they are attracted by the opportunities for service to their fellow men. The majority of the applicants whom one has an opportunity to see, it is true, come from the city and have no knowledge of the life and environment, or the sort of problems presented in the daily round of a country physician. Many of them visualize a life in their own or another city in the practice of one of the specialties. This is borne out in the later undergraduate years. I have had occasion to note on certain applications which ask the student's intentions after graduation, the answers to this inquiry. The majority announce their intention of spending several years in preparing themselves for special practice.

It is interesting to speculate on the reasons for this general tendency for our students to veer away from a life devoted to general medical practice. The most usual answer is the fact that the practice of medicine is so complex that a man can never hope to master it in all its branches. That is certainly true, but it is possible for a physician to be sufficiently trained and experienced so that he can, if he applies his knowledge—even the knowledge which he gains as an undergraduate—understand the indications and appreciate the signs of disease in practically all its manifestations. In other words, he can differentiate between what is normal in symptoms and physical signs, and what is abnormal. He may

need special assistance from the laboratory or even his specialist colleague to make an accurate diagnosis, and he certainly will frequently need the help of the specialist in the matter of treatment.

It may be unseemly that I should write to you on the importance and place of the physician in the medical world because with the exception of a short period of general practice my professional life up until the beginning of the last war was spent in specialist practice. I have always held, however, that the family physician was, and in my opinion will continue to be, the solid basis of sound medicine in this country. He should not, and I trust never will be, under any "new deal" in medical economics, relegated to a secondary position.

The medical statisticians who deal in such matters say that not more than 15 to 18 per cent of those in active practice should engage in the specialist field. For instance in the figures published by the United States Public Health Service one specialist in orthopaedics is necessary in a population of not less than 100,000, one paediatrician to 30,000 population, one gynaecologist and obstetrician to 20,000. The figures for the other specialties are also given. Such an estimate implies that the general physician on the one hand will be knowledgeable and well trained but will refer to the specialist those cases which demand the skill of the specialist in diagnosis and treatment. On the other hand, it implies that specialists will for the most part see only patients referred by the family doctor, and certainly that they will not engage in practice beyond the lines of their particular specialty. Frequently in American and Canadian practice the patient feels perfectly free to go direct to a specialist for what he believes to be a special symptom or complaint, and the specialist, having been told by the patient that he has no family doctor proceeds to diagnose and treat him, or as frequently happens, learns that he has no complaint relating to his own particular specialty, and sends him to another specialist colleague. Frequently the whole situation could have been promptly handled by his family doctor with less inconvenience and expense. But that is only one side of a complex question—the relation between patient, family physician and specialist—and it is one which I do not propose to discuss further at the present time.

As I have already suggested, the physician should by the taking of a proper history, the conducting of a careful physical examination and the use of such diagnostic aids as are available in a well equipped consulting room, go far in the diagnosis of the majority of patients who consult him. In nearly every district X-ray and laboratory facilities are available at a hospital or through a travelling clinic. The majority of patients can be treated without reference to specialists. If the physician refers a patient for special opinion or for treatment he should certainly follow his patient through the hospital or special clinic, either by visits or by letter, and be prepared to supervise his convalescence and follow-up treatment. The majority of family physicians will do maternity and children's practice, referring only those problems which present special difficulties. They will deal with minor surgery, depending on their own training and ability, but will be well advised to seek advice in any difficult or major fracture, or indeed any serious case of trauma. These cases are frequently the basis for medico-legal

disputes. Not the least interesting feature of the family physician's role is the solving of the patient's personal problems—the patient who suffers from psychosomatic symptoms or milder degrees of psychiatric disabilities and emotional disturbances. I am convinced that the reason for such large numbers of specialists in the psychiatric field in American practice, is the fact that the modern family physician has lost the "art" of practice and the wisdom and ability to apply such insight to the problems of his patient. A great number of so-called "psychiatric problems" are no more than the problems of life itself, and the best guide for such a patient is the family physician, who I believe should be a psychiatrist in the sense that he should have, and constantly apply, a sound knowledge of human emotions and human reactions to a variety of situations.

This then is the physician's life, and immediately there is the objection that there is not sufficient time, that such a life leaves no time for holidays and relaxation, that the financial returns are not commensurate with the training demanded and the effort expended. Certainly a man must, if he is to be happy in the life of a physician, even although it is in special practice, be prepared to get some of his reward from the satisfaction of service to his fellows, from the sense of a job well done. If he begins with the recognition of the fact that the profession of medicine exists for the benefit of the public and seeks in every way he knows to fulfil his obligations, he need have no fear of inadequate financial returns, and he will enjoy a contentment which comes only from good service to his fellows.

There must be the "tools for work," and arrangements for holidays. In English practice and to a lesser degree in this country, three or more men conduct their practices on a group basis. By this means more adequate nursing and secretarial assistance may be obtained, more liberal accommodation for offices and examining rooms, and more important still a rotation of duty at night, and adequate provision for weekly and other holidays. In the more isolated communities undoubtedly some of the amenities of this sort should and will be provided by the local health authorities. In no other way can such communities expect to get adequately trained physicians.

Living in the country town or village has certain compensations. Certainly it is evident that many doctors who are compelled to live in cities are seeking constantly for small country holdings where they may get away from the daily round of metropolitan life. Pleasures, though perhaps of a simpler nature, are certainly less expensive, and it is fortunate that many professional men appreciate the cultural and aesthetic values of life in a Canadian country town, and prefer to live their lives amid such surroundings.

It is recognized that there are still frontier areas in this country and in these situations the physician will be, for some time at any rate, deprived of many of the things in life and practice that are desirable. I would hope that there may be a few men of pioneering spirit who might find such areas a challenge and adventure. Not long ago I talked with a young physician who had been two years at the "end of the line" in the Peace River district. He felt himself part of a rapidly growing community, was interested in the development of schools, the local hockey team, the building of a new airport, and a dozen other civic pro-

jects. The town had built him a small modern suite of offices, and I have every reason to believe he was doing excellent medicine and at the same time enjoying a very interesting life.

How much and what type of training should one have for the practice of general medicine? Certainly one year in rotation hospital work and if one is prepared to spend another year in hospital I should recommend at least four months in medicine, six months obstetrics and/or paediatrics, and if possible two months in minor surgery. If one could get a year in a good group practice with sound older men, this would be of the greatest value. Under our present system of hospital interneships and residencies, it is difficult to obtain the second year of ideal training for general medical practice. The question might well be the subject of consideration by the heads of the various clinical departments.

The student then must keep in mind that approximately eighty per cent of his class will be needed to fill the needs of general practice, and that it does offer opportunities for a full and satisfying life, often in an atmosphere which is much to be preferred to that in which the specialist lives and works. A current tendency of thought in certain schools which implies that a man goes into general medical practice because he is not good enough for specialist practice is, I believe, wrong and will, if followed to its conclusion, leave us a nation of people who try to make our own diagnoses and consult in turn the various specialists who we believe can treat our symptoms. Such tendencies are apparent in American life at present. The New York business man talks of "his psychiatrist" and his "nose and throat fellow" much as he talks about his insurance broker or his garage man. Only the return of the general physician to his proper place of doctor and adviser to the family can save the profession generally from such loss of dignity, and relegation in the public mind to the category of mechanistic aid. Fortunately the pendulum has not gone quite so far in Canada as in the great metropolitan centres of the United States. To maintain our own standards of practice, however, we will need men of intelligence, sound training and culture in general practice, and we will also need at all times the support and careful ethical standards on the part of our specialist colleagues. We have such a large proportion of students from urban centres that to meet the needs of the country a good proportion of these will in some way have to learn the essential values of service in its broader sense to the smaller communities, to appreciate a mode of life which may be entirely different to that in which they were nurtured, and to be willing and keen to seek such opportunities. Otherwise some sort of scheme to encourage a larger admission of country students must be sought.

This article written by our Dean, Dr. MacFarlane, is the first of a series of features that the Journal hopes to publish this year, dealing with the various specialties and divisions of medicine that the student or the intern is likely to pursue. Future features will cover internal medicine, surgery, and obstetrics and gynaecology.—FEATURE ED.

Abstracts

E. R. YENDT, Editor

List of Contributors

W. G. B. Casselmann
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Evaluation of Dietary Factors in Treatment of Laennec's Cirrhosis of Liver. A. J. Patek, Jr.: *J. Mt. Sinai Hosp. 14*, 1-7 (1947).

One hundred twenty-four patients with cirrhosis of the liver have been treated at the research service of the Goldwater Memorial Hospital during the past ten years. They were given a highly nutritious diet which was supplemented with brewer's yeast and injections of thiamin chloride and liver extract. The diet included meat twice a day, green vegetables, fruit, and dairy products. Milk was given five times each day—with each of the three meals and twice as milk nogs containing the yeast powder. On the average, the daily diet contained 3,591 Calories. The patients did well on such a diet and in about two months began to show significant improvement.

The results with this series of patients were compared with a series of three hundred eighty-six patients with cirrhosis of the liver who were treated in five New York hospitals during the period 1920-1930. The patients in this control series received either no special dietary consideration or the high carobhydrate, low protein diet which was standard at that time.

At the end of one year, 65 per cent of the specially treated series were alive, in contrast to 40 per cent for the control series. At the end of five years the corresponding percentages were 30 and 7.

Patek concludes that the concept that cirrhosis of the liver is a disease with a relentless downhill course is no longer justifiable. A significant number of patients with serious liver damage and a much larger proportion of those with moderate liver damage can recover with dietary treatment.

W. G. B. C.

Emotion: Etiologic Relation to Illness. E. L. Caveny: *U.S. Naval Med. Bulletin 47*, 421-428 (1947).

Caveny states that the average medical practitioner encounters few medical or surgical problems which do not have a psychosomatic component. Environmental, educational and social influences are constantly checking and subduing instincts, personal desires, and ideas. Conflicts arise from the interaction of these opposing forces. Anxiety, headache, nausea or vomiting may result when there is faulty adjustment. Persons with psychosomatic disorders do not always show manifest symptoms of emotional imbalance and, consequently, the psychic factors often remain undetected, and recovery may be delayed or prevented.

Until recently it was generally believed that only gastro-intestinal conditions, such as gastric ulcers and colitis, could be considered to be psychosomatic in origin. Now, the emotions are considered to be important causes in many cases of bronchial asthma, hay fever, hypertension, heart disorders, the common cold, various dermatological conditions such as hives and the allergic reactions, as well as many other physical illnesses. Where the emotions are not the primary cause, they may be a precipitating or aggravating factor.

The general practitioner's responsibilities are prophylactic, therapeutic, and morale building. He fulfils these by establishing and maintaining a philosophy of medicine which makes for a full knowledge of the sick man, a person whose illness may have a social implication. He must possess, through training and intuitively, a considerable knowledge of psychiatry, the psychosomatic approach, and the basic principles of psychotherapy.

W. G. B. C.

Are Frozen Foods a Public Health Problem? G. A. Fitzgerald: *Amer. J. Pub. Health 37*, 695-701 (1947).

Frozen foods have been remarkably free of suspicion in connection with their being health hazards either in enterotoxic food poisoning or in infectious diseases. During spoilage, an acid producing streptococcus appears to sour the foods beyond edibility before enterotoxins can be elaborated. It is possible that certain pathogenic organisms may survive the freezing and low temperature storage and retain sufficient viability to cause food-borne infections. Therefore these could be a source of infection in frozen foods of the very best quality because the souring would not be present to warn the consumer. Frozen fruits and vegetables which may be served in raw salads could very well be sources of infection. These can be controlled only through careful sanitary procedures in factories. Laboratory methods of detecting the incidence of toxigenic or pathogenic micro-organisms are at present inadequate and so frozen foods may momentarily be implicated as health hazards. The industry thus has every reason tosupport thorough research in the development of better control methods.

W. G. B. C.

Prevention of Postoperative Pulmonary Embolism. J. A. Evans, J. A. Boller: *New Eng. J. Med. 236*, 392 (1947).

In a review of fifty-two fatal cases of pulmonary embolism, the authors found that in 85 per cent the records presented evidence which might have led to a suspicion of the existence of the condition and to the institution of adequate therapy. All postoperative patients should be carefully followed for early signs and symptoms of thrombosis: tenderness in the calves, and elevated temperature or pulse rate. When thrombosis is suspected, anticoagulant therapy should be instituted immediately. A single injection of heparin starts to be effective within two hours and will protect the patient during the two day latent period for dicumarol therapy to become effective.

Fatalities due to pulmonary embolism occur most frequently during the sixth decade. In the entire series, 54 per cent of the deaths occurred following extensive surgery in the lower abdomen or pelvis. It seems probable, therefore, that the anticoagulant therapy should be routine in such cases. Fifty-two per cent of the fatal embolisms occurred between the sixth and sixteenth postoperative days; however, they can occur at any time before or after this period and must be watched for continually.

The incidence of pulmonary embolism has been reduced to one-third by prophylactic foot exercises—all such patients should wiggle their feet one thousand times per day. The influence of early ambulation is not discussed.

Anticoagulant therapy and venous ligation are considered to be complementary. Ligation is to be preferred where laboratory facilities for the accurate estimation of anticoagulant activity are unavailable. The authors limit femoral ligation to those patients with (*a*) thrombosis and awaiting a second-stage operation; (*b*) any hemorrhagic tendency; (*c*) poor liver function; and (*d*) ambulatory recurrence with phlebothrombosis with pulmonary embolism.

W. G. B. C.

THE ETIOLOGY OF MONGOLISM. T. H. Ingalls: *Am. Jour. Dis. of Child.*

Mongolism is a congenital form of mental deficiency, recognized by slanting eyes, narrow palpebral fissures, marked wrinkling of the forehead on crying, a small brachycephalic head, short stature, and hypotonia.

Frequency: 3.4 per 1000 live births.

Sex incidency: three males to two females.

The mortality in the first five years of life is high, chiefly because of intercurrent infections.

Seventeen to twenty-one per cent of mothers have had haemorrhage during their pregnancy; usually occurring in the sixth to ninth week of gestation. Only one per cent of controls had haemorrhage. Several instances are cited in which a mongolian child was born following an acute infection, or rubella during the same period of pregnancy .

During the sixth to ninth week of pregnancy, embryonic skeletal chondrification nears completion. The cerebral hemispheres expand, the basilar portions of the skull push forward, and septal compartation of the heart occurs. Arrest or interference with development at this time could account for the frequent rudimentary fifth digit of the hand, mental retardation, small rhinopharynx and cardiac malformations of mongolian idiocy.

With increasing age and parity, tumors of the uterus cause increasingly frequent mechanical disorders which may interfere with embryonic development. This is interesting when related to the fact that the peak of maternal age incidence in mongolism is at forty-one years, and a mongolian child is often the last of a large family.

Experiments with developing fish eggs indicate an early period of vulner-

ability to certain chemical agents which have their effect by inhibiting the oxygen carrying enzyme systems.

Haemorrhage, threatened abortion, and anomalies of the uterus acting during the sixth to ninth week of pregnancy would seem to be responsible for the production of a mongolian idiot from a normal embryo. The suggestion is made that anoxia is the important noxious factor, with starvation, and accumulated toxins to be considered.

J. S. L.

Lumbar Puncture Reactions: Relative Importance of Physiological and Psychological Factors. Frederick C. Redlich, Burness E. Moore and Ishman Kimbell, Jr., Psychosomatic Medicine, Volume 8, Number 6, November-December, 1946.

The three authors, working in the Department of Psychiatry and Mental Hygiene, Yale University School of Medicine, selected a random group of 100 hospitalized psychiatric patients, whom they punctured routinely. Proceeding on the hypothesis (supported by considerable evidence) that post-puncture symptoms—viz., headache, backache, dizziness, nausea and vomiting—are due to the leakage of cerebrospinal fluid through the hole or holes made in the dura by the needle, the patients were divided into two groups of 50 each, on one a 16-gauge needle being used, and on the other a 22-gauge. The larger 16-gauge needle predisposed to increased drainage and consequently more severe reactions would be expected in this group. The results showed that 54% of the total number of patients manifested some lumbar puncture symptoms; in the 16-needle group, 74% reacted unfavourably as compared to 52% in the 22-needle group. Five times as many severe reactions occurred with the larger needle, and the duration of symptoms was markedly longer.

The patients in each group of 50 were also classified as to intelligence, mood, emotional stability, anxiety tendencies and hypochondriacal trends. It was found that the intrinsic personality traits of the patients did not significantly affect reactions but knowledge of ill-effects did increase post-lumbar puncture sequelae to a statistical extent. Suggestion, therefore, appears to be the primary psychological factor in the production of symptoms.

The authors conclude that drainage of the cerebrospinal fluid is the most significant factor in the production of post-puncture symptoms, outweighing the small contribution of emotional elements.

H. A. P. M.

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*R. H. Follis, D. Jackson, M. M. Eliot, and E. A. Park: Prevalence of rickets in children between two and fourteen years of age, Am. J. Dis. Child. 66:1-11, July 1943.

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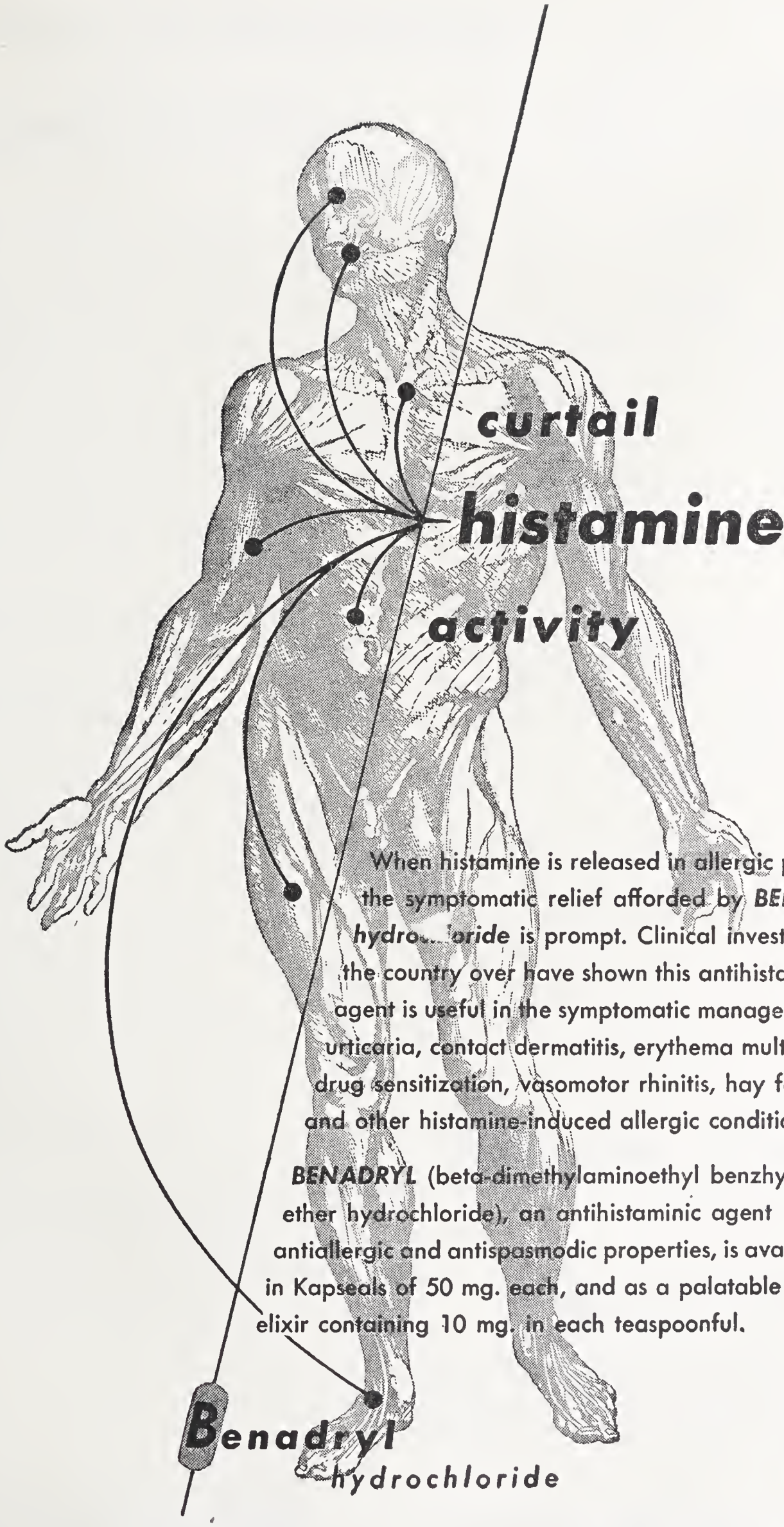

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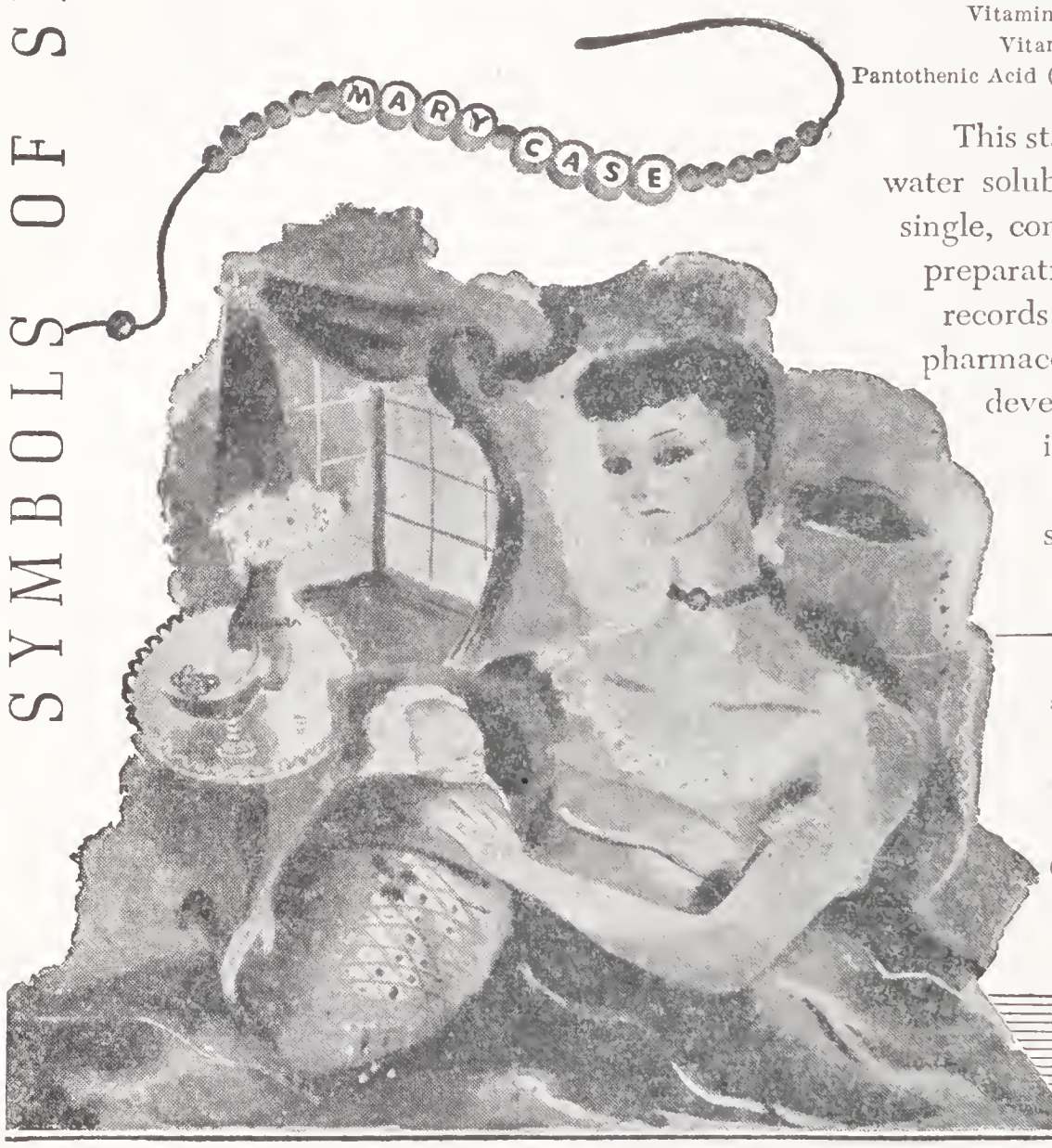

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